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can occupy themselves much more profitably with the examination of physical characters than in the elaboration of theories of origin and of migrations. The scanty somatological data furnished in this paper show that the Funafutti natives are a brachycephalic (index 82.5) race of medium stature (M 1.67). Mr. Hedley's descriptions of their technic arts are clearly and concisely written, and form a valuable contribution to our knowledge of the culture of Oceania.

FRANK RUSSELL.

The Mounds of Louisiana.¹—In a paper of twenty pages Professor Beyer has described his explorations among the mounds of north-eastern Louisiana. Several skeletons were found, but in such a fragile condition that they could not be preserved. An attempt is made to establish the cranial type from four measurements taken upon five more or less fragmentary skulls, and to prove its southern affinities by comparison with a single Carib skull! With equal success we have recently compared the three principal diameters of the brain case of a series of thirty-three Eskimos with the fifty blacks from Torres Straits, described by Flower! The pre-Columbian type is presumably depicted in the two unnumbered plates entitled "Larto skull" and "Larto skull restored." If this skull were properly oriented, say, about forty-five degrees forward, the "type" would be transformed into an ordinary Indian cranium.

A few specimens of pottery were found, one of which is ornamented with an artistic design containing the Maltese cross and the swastika; that it is "entirely too fine in execution to be ascribed to our North American Indians" is an error manifest to any one at all familiar with American ceramics.

FRANK RUSSELL.

ZOÖLOGY.

The Segmentation of the Head.—This perennial problem has been attacked again by Dr. H. V. Neal,² who has based his work upon the early stages of the common dogfish of the New England

¹ Beyer, Prof. George E. *Publications of the Louisiana Historical Society*. New Orleans, La., 1898.

² The Segmentation of the Nervous System in *Squalus Acanthias*. *Bulletin Mus. Comp. Zool.*, vol. xxxi, No. 7, 1898.

coast. Only a few categorical statements can be made here concerning his conclusions. The work was begun to ascertain in how far the neuromeres of Locy could be used in solving the problem of the number of segments in the vertebrate head. His conclusions on this point are that these structures are not of segmental value ; that in no case are they symmetrical on the two sides of the embryo, and no definite relations to the somites could be ascertained. Again, he has been unable to trace these dorsal structures into the hind-brain neuromeres. Neal regards them, and this opinion seems plausible to the reviewer, as results of unequal growth along the margin of the ventral plate. He differs, too, from Locy in his determination of the posterior limits of the expanded cephalic plate, the posterior boundary of which corresponds to the hinder margin of the later auditory invagination.

Next Dr. Neal considers the neuromeres of Orr. In the hind-brain region he accepts these structures as metameric in character, but points out that Orr's criteria apply only to the later stages ; in earlier embryos the constrictions separating the neuromeres are not only lateral, but dorsal and ventral as well. These neuromeres are entirely independent of influence from the mesoderm, and as paired ganglionic enlargements of the central nervous system at once suggest comparisons with the ventral cord of annelids. In the region of the spinal cord, on the other hand, the neuromeres differ somewhat in structure and development from those of the hind-brain, and their existence, at least in part, seems to depend upon the adjacent segments of the epimere.

The so-called neuromeres of the fore- and mid-brain regions are not equal to those of the other part of the brain, as they are later in appearance and are cœnogenetic in character. The two primary vesicles, fore-brain and mid-brain, are each of neuromeric value. So, counting all these, Neal recognizes one each for the fore- and mid-brains, and five in the hind-brain back to the "Urvagus," a total of seven in the primitive head. He fails to see marked differences between the pre- and post-auditory regions of the head, and regards the somites as serially homologous.

The relations of the neuromeres to other apparently segmental structures is then taken up with the following results, the table being slightly altered in its arrangement from that of Neal :

NEUROMERES.	SOMITES.	NERVES (DORSAL).	NERVES (VENTRAL).	VISCERAL CLEFTS.	VISCERAL ARCHES.
I	"a"	I (olf.)	lost		1
II	1	oph. pr. V.	III	lost	1
III	2	V	IV	mouth	1
IV	3	(V) ²	(VI) ²	lost	(1) ²
V	4	VII	(VI) ²	1	2
VI	5	IX	(VI) ²	2	3
VII	6	X	VI	3	4
VIII	7	X	1 spinal ³	4	5
IX	8	1 spinal ⁴	1 spinal ³	5	6
X	9	2 spinal ⁵	1 spinal ³	6	lost ⁶
XI		3 spinal ⁵		lost ⁶	lost ⁶

Neal further concludes that there was originally a correspondence between neuromerism, mesomerism, and branchiomerism, and that a visceral arch has been lost in the region of the fourth neuromere. The segments VIII to XI have been added from the trunk region to the occipital region, the number varying in different vertebrates.

Many details are given of the development of the neural anlagen nerves, somites, etc., and comparisons are made with *Amphioxus*, the results of which are summarized as follows:

"In agreement with van Wijhe, I homologize the mouth of *Amphioxus* with the left half of the mouth of *Craniota*. The first pair of permanent visceral clefts in *Amphioxus* are exactly homologous with the hyomandibular clefts of higher vertebrates. The eight visceral clefts possessed by *Amphioxus* at its 'critical stage' (Willey) are exactly homologous with the eight morphological clefts found in some *Selachii* and *Cyclostomes*."

Closely connected with the subject of this paper by Dr. Neal is a shorter but suggestive article⁷ by Mr. Cole, which, however, is based upon the anatomical rather than the embryological side of the problem. The matter is so condensed as to admit of no satisfactory abstract, since it deals not with new investigations, but is rather a summary of conclusions drawn from existing knowledge.

¹ Possibly represented by labial cartilages.

² Theoretical relationships.

³ From the first three roots of the embryonic hypoglossal.

⁴ Fuses with dorsal ganglion of X.

⁵ Ganglia disappear in development.

⁶ Found in *Diplospondyli*.

⁷ Reflections on the Cranial Nerves and Sense Organs of Fishes, by F. J. Cole. *Trans. Liverpool Biol. Soc.*, vol. xii, 1898.